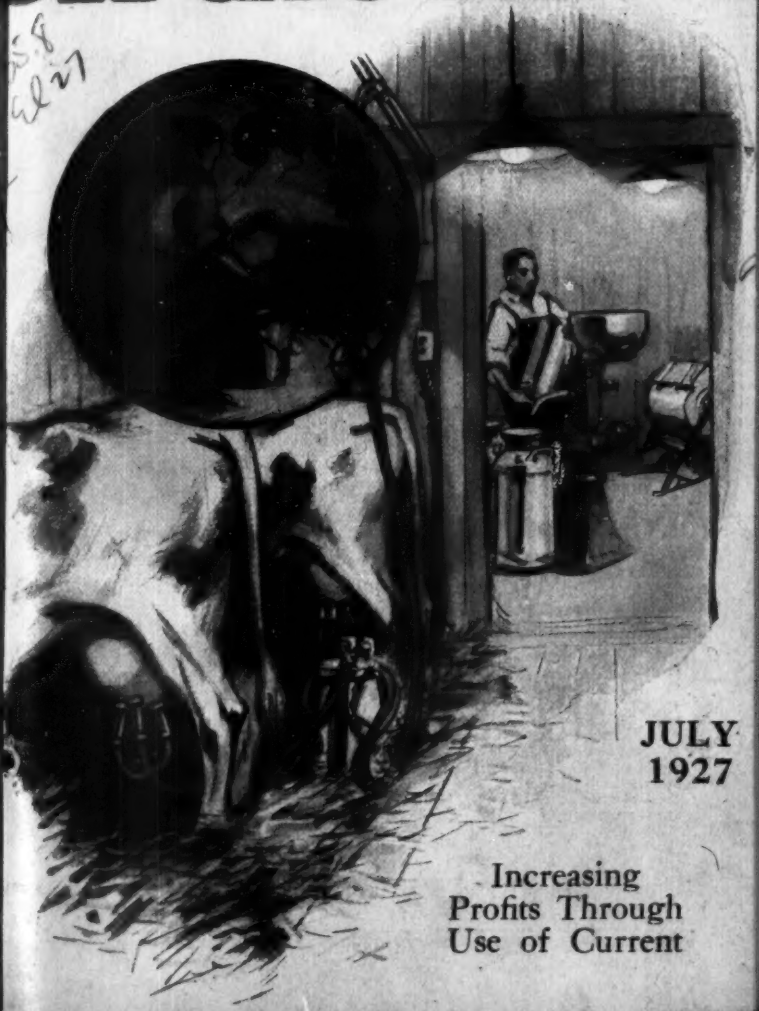
# Electricity on the Farm

DEC 14 1927



JULY
1927

Increasing
Profits Through
Use of Current

# The Path to the Well

FOR centuries men and women have borne this burden—walked thousands of miles carrying tons and tons of water. Yet a little electric motor will deliver more water for a cent than a man can pump and carry in an hour.

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At the barn, electricity is the big worker that helps men get things done.

**If you are on an electric line or hope to be soon, ask your electric power company for the G-E Farm Book which explains many uses for electricity on the farm.**

**General Electric motors save foot work and back work on the farm. The same qualities of endurance and adaptability are built into G-E Wiring Systems, G-E MAZDA lamps, and dozens of other electric devices for the farm.**

# GENERAL ELECTRIC

# Electricity on the Farm

Vol. 1 JULY 1927 No. 1

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KARL M. MANN, *President* I. H. CASE, *Vice-President*
FRED SHEPPERD, *Editor*

*Western Manager:* H. T. MURRAY, 30 No. Michigan Ave., Chicago, Ill.

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# Can We Help You?

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This is *your* page! If you want complete information on electric appliances and equipment of any kind, just jot down on the coupon below the numbers opposite whatever you're interested in, mail it to us, and without cost or obligation to you we shall be glad to have reliable manufacturers send you the information you desire. *Help yourself!*

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# WE MAKE OUR BOW!

YOU have in your hands the first copy of ELECTRICITY ON THE FARM, a magazine to be issued monthly in the interests of those farmers who already have or anticipate having central station electrical service. Tremendous strides have been made in the past few years toward the extension of high tension lines into rural districts and at the present moment this work is going ahead at an astounding rate.

Naturally, with the adoption of electricity on the farm, new uses for current are continually presenting themselves. Farmers with a native ingenuity have lost no time in applying electricity toward the solving of many of their problems with the result that daily new applications of electricity on farms are being developed.

It will be the function of ELECTRICITY ON THE FARM to set forth before its readers the latest developments in the field, telling them of new and proven uses for electric current as well as setting forth data which will aid in securing the most out of electricity.

We want our readers to feel that this little magazine is the clearing house for helpful ideas in connection with the use of electricity on farms, and invite you to tell your brother farmers through this publication of any new application or use you may discover for electricity in farming which would be of interest and value to them. The columns of ELECTRICITY ON THE FARM are open for just such material and it goes without saying that rural users of electricity will appreciate, as much as will the editors, such suggestions.

With this little introduction ELECTRICITY ON THE FARM makes its bow.

*"The Modern Chicken House Like the Modern Factory Does Not Wait on Daylight, but is Illuminated at the Same Hour Each Morning Irrespective of Weather Conditions."*

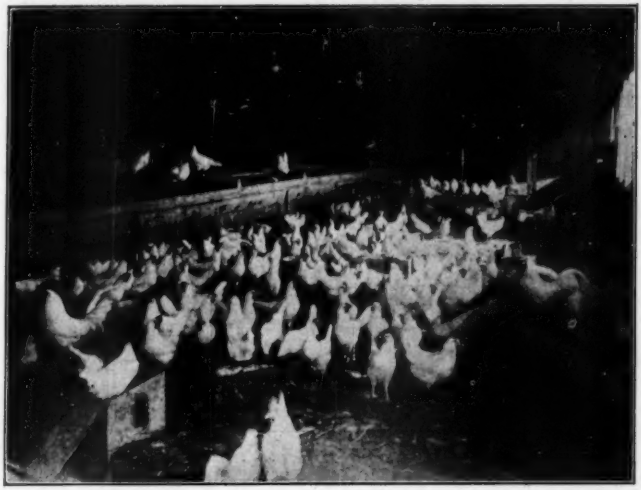
# Electricity for the Poultry House--

## *a Moneymaker fo*

FROM probably no other application of electricity on the farm are the results so noticeable as from electrification of poultry houses. It has been known for many years that artificial illumination so timed as to lengthen the day during the fall and winter season has a beneficial effect on egg production but precise figures on what could be accomplished by artificial light have not been sufficiently broadcast to enable the average farmer to know just what he may look for in the way of increased egg production.

Statements have been made from time to time to the effect that the use of electric lights in hen houses would increase the egg production anywhere from 25 to 100%. In order to determine exactly what such illumination would do the Extension Service of the Alabama Polytechnic Institute at Auburn, Alabama, conducted very comprehensive tests.

These tests proved, first, that artificial light increased egg production very materially. In five weeks' time egg production from 960 hens increased 59% under artificial light. This work



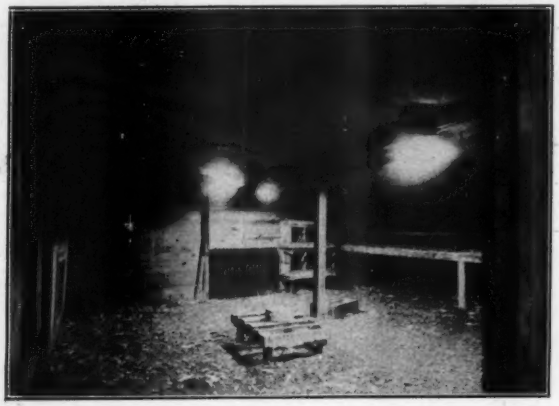
**Electric Lights Will Keep Your Poultry Active for a Longer Period Each Day, and Will Result in a Very Distinct Increase in Egg Production.—A Very Important Consideration in Winter Time When the Price of Eggs Is High.**

## ...for the Farmer

was done on a poultry farm of the institute and was undertaken to stimulate poultry production throughout the state as well as to develop accurate data on the effect of artificial light upon egg production.

On October 26th an egg laying contest was started at the institute consisting of 96 entries of 10 hens each. These entries were not only from the state of Alabama but also from other states and one entry was from England. To house these hens 48 laying houses were constructed, each with two separate compartments. An entry of 10 hens was put in each compartment. On the 15th of the fol-

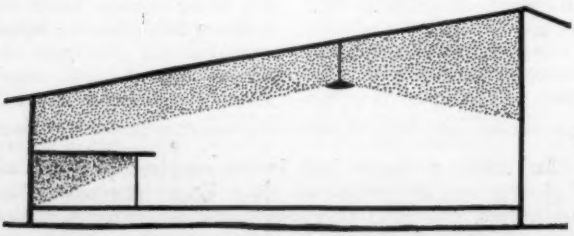
**In Iowa, a single hen house employing artificial lighting had an output of 4,530 eggs, whereas while unlighted the yield had been only 805 during a like period in the winter season. Cost of light was almost negligible.**



**Not Only Does Proper Illumination Improve the Sanitary Condition of the Chicken House, But It Improves the Condition of the Poultry as Well.**

lowing January a 50-watt lamp was installed in each compartment, the lights were first turned on 8:15 P. M. on Wednesday of the 12th week of the contest for a period of 15 minutes, during which time the hens were driven from their roosts and fed a small portion of hot mash. The time was gradually increased each night until at the end of the week the lights were turned on one hour each evening from 8:15 to 9:15 and the hens fed hot mash. The resultant increase in egg production during the next five weeks is given in the accompanying table.

At the end of this time the production had increased from 2,928 to 4,645 eggs per week, a total increase of 1,717. Eggs



**Lighting Units for the Poultry House with Proper Reflectors Intensify the Light On the Floor and Dropping Boards. Place Them 10 Feet Apart, 6 Feet from the Floor, and Half Way from the Front of the Dropping Board to the Front of the House.**

were selling at this time for 70 cents per dozen, so the increase represented an increase in gross revenue from the 960 hens of $100 per week. The energy consumed during the five weeks was 148 kw-hr., and at a rate of 9 cents per kw-hr. this would amount to $13.32. In addition to the cost of electricity there was the cost of labor and feed, but with all costs included there was still a net increase of $75 from the 960 hens for the five-week period.

Probably the most important factor in connection with stimulating egg production by the use of light is the increasing of production at the time when eggs are the highest in price.

To those who have looked askance at the efforts to induce hens to lay more eggs by artificially prolonging "daylight" and have felt that in a sense it was reprehensible thus to take an unfair advantage of the unprotected birds, the news that this process has increased the winter's yield of eggs in one case five fold—on an Iowa farm—will stand as a matter deserving attention—representing one case where an unusual increase had been secured.

Speaking before the Annual Convention of the American Farm Bureau Federation, Mr. R. F. Pack, President of the National Electric Light Association, told of the instance in which, by artificial lighting, this single hen house had an output of 4,530 eggs, whereas while unlighted the yield had been only 805. The additional cost was slight.

EFFECT OF ARTIFICIAL LIGHTING DURING EGG LAYING CONTEST IN ALABAMA

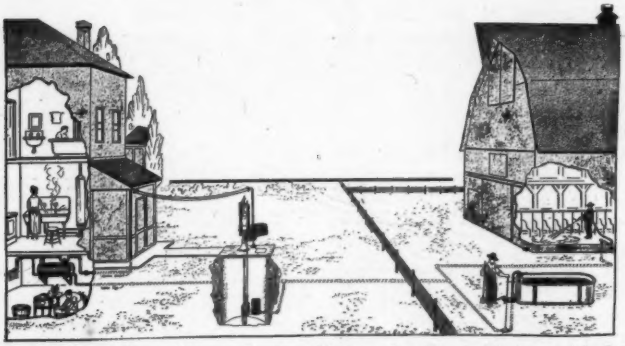
| Week | Egg Production | Increase | Production Per Cent | Increase Over Preceding Week Per Cent |
|---|---|---|---|---|
| Eleventh week..... | 2,928 | ..... | 43.5 | ..... |
| Twelfth week ..... | 3,162 | 234 | 47.55 | 4.05 |
| Thirteenth week..... | 3,542 | 380 | 52.7 | 5.15 |
| Fourteenth week..... | 4,032 | 490 | 60.0 | 7.3 |
| Fifteenth week..... | 4,447 | 415 | 66.6 | 6.6 |
| Sixteenth week..... | 4,645 | 198 | 62.28 | 2.69 |

And the increase in egg production is not all the benefit secured from electricity.

State poultry authorities in California as well as the Poultry Raisers Association have found as a result of their experience that electrically operated incubators produce more uniform incubation and better and stronger chicks than any other kind of heat.

It is not surprising, therefore, that the largest incubator in this country, which hatches eggs at a rate of 3,000,000 chicks a year, is electrically operated. It is installed at the Must Hatch Incubator Company at Petaluma, California. In this incubator electricity maintains the heat at

(*Continued on page* 30)



**The Modern Farm Water System Makes the Farm Home, with Its Natural Attractive Surroundings, More Enticing Than the City Dwelling. It Also Results in a Better Condition Among the Livestock, Through Making It Easy and Convenient to Keep Barns Clean and Stock Supplied with Pure, Fresh Water. In Addition, It Actually Saves Money by Giving the Farmer More Time to Devote to Productive Effort.**

# The Water System—

## *A Mighty Fine Investment for the Farmer*

EVEN though it's not a very pleasant job to get busy and fill the water trough with hand pump or buckets after returning from the field following a hard day's work, this is not the only disadvantage in connection with having the old hand pump and well as your source of water supply.

It's the time it takes to do this task that is of greatest importance.

You or the hired man may spend a lot of your good time each day watering stock with the hand pump. If so, just look at these figures. Average time taken to pump and deliver one gallon of water to the trough is 40 seconds.

Time to pump and deliver 50

**Measured in human life, happiness, labor, time, help, cash, or effort, the installation of a water system in a home is the cheapest improvement a farmer can make. It is one improvement which costs more NOT to add to the farm home than it does to buy and install it.**

gallons to the water trough is 33 minutes.

And here's the figure that hurts: Electricity can do the same thing (pump 50 gallons) for less than one cent. As a matter of fact, the California Electrical Bureau figures that electricity can lift 5,000 gallons of water from a well 50 feet

**Here's the Very Heart of One Type of Water System—the Motor with Compressor and Automatic Pressure Regulator. When the Pressure in the Tank Drops Below a Certain Point, the Electric Motor Starts Up Automatically and Operates the Compressor Until the Pressure Is Returned to Normal**

deep for the insignificant sum of 10 cents.

In other words, your half hour's work in pumping water for watering the stock represents an earning of less than one cent.

Pretty low wages, we'll say!

If this same time could have been put in productive work such as cultivation of fields, gardening, etc., you would have made many times over what it would have cost you for current to pump the water.

This is just one item in connection with the water supply of a farm, but it indicates pretty clearly that human labor cannot begin to compete with electricity when it comes to economy in working.

Then, again, when it is remembered that the average farm household uses 75 tons of water a year, it can readily be appreciated what a great amount of work the handling of this water entails on the part of the housekeeper where water must be secured from old fashioned wells by hand pumps.

A plenteous supply of water for your stock around the farm buildings and in the pasture will bring you big dividends in better condition of the stock and increased returns in milk, where dairy cows are kept.

The use of windmills may be all right where but small quantities of water are needed, but when you require a comparatively heavy draught on your system and where you must

*(Continued on page 32)*

**What a Difference Between Turning the Faucet in Getting Your Supply of Water and Having to Chase Out in the Yard to an Old Hand Pump and Pull the Water Laboriously from the Ground—to Say Nothing of the Inconvenience in Cold Winter Weather.**

*Electricity on the Farm Saves Labor—Which Means Time—And Hence Money. Whether in Driving a Small Emery Wheel for Sharpening Farm Implements, as Shown in the Cut Herewith or Whether in Operating the Various Farm Machinery the Results are the Same.*

# The
## Wh

IF the average farmer were asked what he considered the hardest chore he had to do he would probably say that taking care of the stock, including watering, feeding, cleaning the stables and other incidental operations, was such. And he wouldn't miss it much.

Any task which regularly takes from a half to an hour every day, and which does not vary, is sure to become burdensome and none too agreeable. Just as the housewife says that cooking is her hardest job, so the farmer can honestly say that taking care of the stock is his most troublesome chore.

Now just consider how electricity can help in doing this particular chore. Your water supply is furnished under pressure by an electrically driven pump. It is only necessary for you to turn a faucet and have an unlimited quantity of water right at hand. Or you may have an automatic float valve to keep your water troughs at the proper level, in which case you are fortunate, for all you have to do would be to check periodically the trough to see that the mechanism was functioning properly.

### Handling of Feed

Then, the handling of feed, including the grinding of it can be done by electricity. A small food grinder makes it possible for you to grind the feed as required, and in this way

*Clipping Livestock is Not a Very Arduous Duty, but it is Nevertheless Made Much Easier by the Use of the Electric Clipper.*

# Isn't a Farm Chore
## e Electricity Cannot Help

furnish your stock with freshly ground food containing all of its nourishment—none having been lost through storage.

Cleaning the stable or barn, throwing down hay from the loft, and other incidental tasks are lightened by electric current. In the first place, you have illumination controlled by switches at proper points. Proper illumination makes work pleasant.

Then you have the water supply furnished by electric power for flushing out the stable, keeping it in a far better condition than would be possible without the use of water. A conveniently placed water tap with a short piece of hose is all that is required to make this task a light one. If you want warm water for mixing mash in cold weather, you can have it right where you want it, by installing electric heaters.

If you use wood in your cook

**"Care of live stock constitutes the most irksome chore on the average farm. But there is not a single operation in this particular chore which cannot be lightened by the use of electricity. Electricity lends a helping hand in practically every chore about the farm establishment."**

stove (a practice which is gradually vanishing with the adoption of the electric range) you do not have to buckle down to hard work sawing it with a buck-saw or cross cut. A portable motor properly mounted can be run into position and by use of a circular saw with pulley and belt, the entire winter's wood can be cut in very short order. Incidentally, sawing wood in this manner is classed as a diversion by most farm boys instead of a drudge as in the case where hand power only is employed.

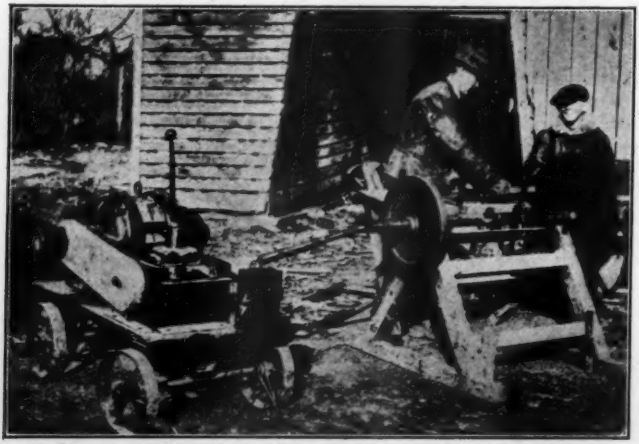
## Milking

It is unnecessary to go into details of the tremendous advantage of the milking machines over hand milking. Milking, even a large number of cows, is no more considered an irksome job where electric milkers are employed. It is merely a question of placing the milker into position, starting it (for each cow or each two cows) and then emptying the milk into containers and transporting it to the milk house after the job is completed. Milking nowadays is surely a snap in a nicely lighted cow barn and using milking machines. In addition, your cow barn is going to be clean when you have water under pressure right at your hand at all times.

Hay hoisting and silo filling are also done in an economical and efficient manner by the use of electricity.

## Household Chores

Among household chores which take time and energy, when done by hand, are churning, separating, washing clothes, ironing, tending the poultry,



**The Portable Motor, Mounted on a Small Truck, Puts the Power Just Where You Want It. Here It Is Being Used for Sawing Wood.**

cooking, dish washing, sewing and sweeping floors.

There is not one of these operations which cannot be aided by electricity.

Even cooking is done far more satisfactorily and in a much cleaner manner with the electric range than with any other type of cooker.

Washing is made easy by a liberal supply of water under pressure both hot and cold;

It's in the Regular Chores Where Electricity Lends the Most Welcome Hand. Here It Is Grinding Feed.

churning and separating are done by power with practically no work on the part of the attendant. Care of poultry is simplified through the use of electrical apparatus including incubators and brooders as well as lights in the chicken houses.

Even when it comes to sharpening tools such as knives, axes, or other appliances, electric current lends a helping hand. It does all the heavy

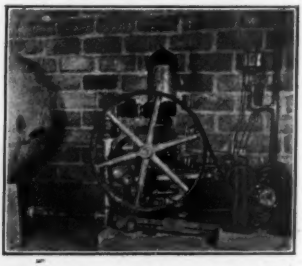
Electricity, in Providing Water for Flushing Out the Cow Barn and Running Milking Machines, Saves the Farmer a Lot of Irksome Work.

Even in Running the Old Grindstone Electricity Proves Its Value. Here a Small Portable Motor Is Belted to the Grindstone, and Incidentally Saving a Lot of Time and Labor.

Here's How a Portable Electric Motor Looks When Belted to a Silo Filler.

work in driving the grinders, whether emery or grind stone, while all the attendant does is hold the device he sharpens. So much for the specific chores on farms in which electricity aids.

Finally, there is nothing more enjoyable than to be able to operate a switch at your kitchen door as you start on your tour of the farm buildings and yard, giving you electric light over your path. All the disagreeable features of farm chores, after the days work is done as well as in the morning before the sun has risen, vanish with the arrival of "daylight" given you by electric power.



**Automatically Controlled Electrically Operated Water System Takes the Chores of Furnishing Water to the House, the Live Stock and the Dairy, Off the Farmers' Hands.**

**On Fruit Farms an Apple Grader Finds Electric Current the Most Satisfactory Power for Its Operation.**

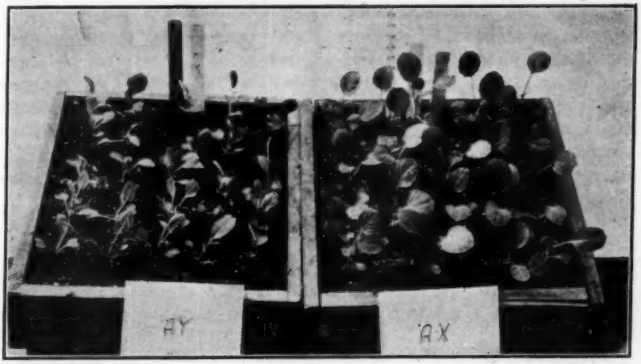
## Laugh at Story of Electrical Control

Many prominent Englishmen still think they are being "spoofed" when anyone tells them actual truths about the use of electricity in the United States. George Wheeler Hinman, financial writer for the Hearst newspapers, recalls an interesting example of this incredulity.

Lord Birkenhead in arguing for a new electric power law to systematize and promote electrical power development in England said: "I have been told that in the United States, if you press a button of an electric oven, you can immediately carry out such processes in cooking as you desire, and the electric current declines automatically as the joint is cooked."

This little story, says the Hearst financial expert, was greeted with derisive laughter, causing Lord Birkenhead to add that he heard the tale from a man who never made a joke in all his life.

Members of the British Labor Commission do not laugh at such stories. They have been over here, and know that American prosperity is due largely to our amazing use of electricity.




Experiments Show That There is a Big Difference Between Plants Grown by Natural Light and Artificial Illumination. The Above Illustration Shows Jersey Wakefield Cabbage with Plants at the End of the Second Week of the Test. At the Right are shown Plants Grown Under Artificial Light and Daylight, While at the Left are Shown Plants Grown Under Daylight Only.

# Doubling Garden Crops with Electric Light

***Artificial Light Doubles the Speed of Plant Growth; Now Grow Garden Crops on Schedule***

WE all thought it was a revolutionary discovery when it was found that artificial light increased egg production.

But still more remarkable is the effect of electric light on the growth of plants.

One of the big power companies, cooperating with a large eastern seed grower, has carried out extensive tests to show that artificial light will play a prominent part in the future in solving the problem of increased production on limited areas.

For example, the tests have proven that it is possible through the proper use of artificial illumination to grow many vegetables as well as flowers at twice their rate of normal growth. Moreover, it is possible, by furnishing additional "daylight" to grow many varieties in territories where they would not produce satisfactorily under normal condition because of insufficient light.

Plants assimilate (absorb) carbon, which is necessary for

their growth only under the stimulation of light. Therefore, the longer plants receive light the more "food" they secure and the faster they grow. Of course, plants require a rest period just as men and animals do, therefore artificial light should be supplied only for a few hours per night,—5 hours were found in the test to be about right—leaving the balance of the night for rest.

As an example of the effects of artificial illumination, notice the picture on the preceding page. At the left you will see Jersey Wakefield Cabbage plants at the end of the second week of test growth. This tray of plants was not exposed to artificial illumination — being supplied only with sunlight.

At the right, you will see plants of the same age—2 weeks—which had both artificial light and daylight. Note particularly how much more sturdy

**Bush Beans of the Stringless Type Shown at the Completion of the Test Period. Left, Grown with Daylight and Artificial Light; Right, Grown with Daylight Only. Both Plants of Exactly the Same Age.**

the plants are which have had the benefit of artificial illumination.

The other illustration shows a comparison between bush beans of the stringless type.

The larger plant was grown with artificial light and daylight, while the smaller one was grown with daylight only.

Farms supplying city markets now have a means of speeding up production so as to have their produce delivered at the right time and when market prices are high. All that it is necessary to do is to have a small greenhouse in which the proper lighting equipment is placed and to use the light in order to make the plants grow faster so that they may be started and transplanted, and harvested at the proper time.

## Electric Lights Trap Night Flying Bugs

Electric lights now dot some of the broad rice fields of Japan where farmers have learned that by the use of electric lamps they can fool myriads of bugs and cause them to commit suicide. These same bugs deposit ravenous larvae in the rice plants to the detriment of the crop.

Experiments have revealed that one 50-watt lamp suspended over a vat of water for each two and one-half acres of ground would attract enough of the insects to materially reduce the damage. The bugs, flying toward the points of light strike against the lamp bulbs and fall into the water to die.

## Electric Lights Test Tree Growth

The development and quality of a tree depend upon its ability to turn the light which falls upon it into growth and strength. Using this principle as a basis, a series of experiments to determine the efficiency of various kinds of trees has recently been completed by the Rocky Mountain Forest Experiment Station in Colorado.

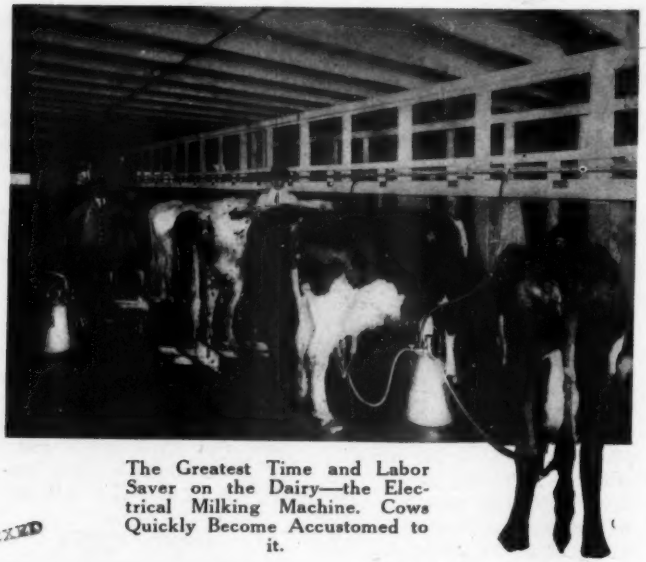
For nine months groups of evergreen seedlings were grown under the light of tungsten-filament blue-glass electric lamps for ten hours a day. It was found that some species were five times more efficient than others in turning this light into growth.

The experiments will, it is said, make it possible to plant only those trees of known efficiency, and so improve timber growth and the future supply of lumber.

## Sterilizing Eggs With Electric Heat

A recent application of electric heat is in the sterilization of eggs. A report from the Pacific Coast describes the success of the first machines electrically equipped for this purpose in that section.

Sterilization is accomplished by passing the eggs through an oil bath at 235 degrees F. The oil fills the pores in the egg shell and prevents air from entering. It is said that tests have been made which indicate that eggs so treated have been kept odorless and fresh for years.



The Greatest Time and Labor Saver on the Dairy—the Electrical Milking Machine. Cows Quickly Become Accustomed to it.

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# Electricity Has Proven Itself on Dairy Farms

LESS than 2/10ths of a cent a gallon—that is what it cost to skim milk by electricity over a 3 months period on a Wisconsin farm. At this was at a rate of 10 cents per kilowatt hour—not a low electricity rate by any means.

Here are the exact figures: The tests were conducted on the Renner Electric Test Line by a State Committee on the Relation of Electricity to Agriculture. The average time required for a cream separator to skim one gallon of whole milk was 51.2 seconds. This was the average of 26 different timings on the separator driven by an electric motor. A total of 427.5 gallons of milk were skimmed in 366 minutes. This was the separating done on the farm from April 25 to July 31. The average number of gallons separated was 16.4 per milking. The motor that drove the separator used 6.5 kilowatt hours of electricity in the three months' time. At a city rate of 10 cents per kilowatt hours this would cost 65 cents, or .152 cents per

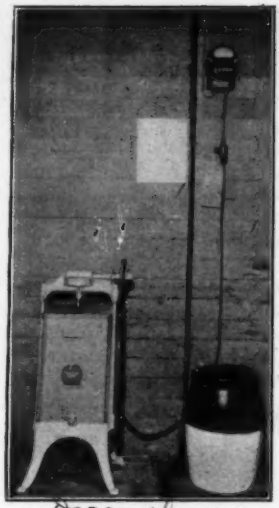
gallon—less than 2/10ths of a cent.

While skimming of milk is but one of the minor operations of the dairy, the above figures show how economically electric current is when applied to dairy farms.

Of probably greater importance is the use of electricity for milking. At the farm of Melvin Groves of Iowa it requires, with the use of electric milkers, but one and a half hours morning and night to milk 26 cows. By hand milking Mr. Groves estimated that 5 hours at least would be required to do the work. Thus he saves 7 hours per day and the cost of electric current used to operate his milking machine is but ten cents a day.

In other words, for an investment of 10 cents in electricity he is able to save 7 hours of labor each day.

And that's just why electricity is making such a big hit on farms wherever it is employed. It saves money—it saves labor—it gives the farmer more time for other duties. By cutting down the force necessary to operate a dairy it saves money and nets a larger margin to the farmer.



The Babcock Tester—One of the Many Electrical Farm Appliances.

Mr. Groves says his cows take more kindly to being milked by the machine than they do by hand milking. He has found by experience that he can change operators of his machine without any noticeable difference in production. Before he began using the machine, it

**The modern dairy farm can profitably use electricity in the dairy for the following purposes: lighting, pumping water, heating water for sterilizing and other uses, for refrigeration, operating separator, churns, and other dairy equipment. In the cow barn it serves for providing water supply, for lighting, milking the cows, clipping and currying, as well as doing the chores incidental to feeding the stock and keeping the barns in a sanitary condition.**

was always a critical time in the dairy to change hired men for it usually meant that production would drop off until the cows became accustomed to the new milker. Now the machine works just the same regardless of who is running it, provided the operator uses a reasonable amount of common sense.

It is really an easy task for Groves or his hired man. They have merely to look after the milking of two cows at a time and to empty the milker into the large cans and start them to the dairy house.

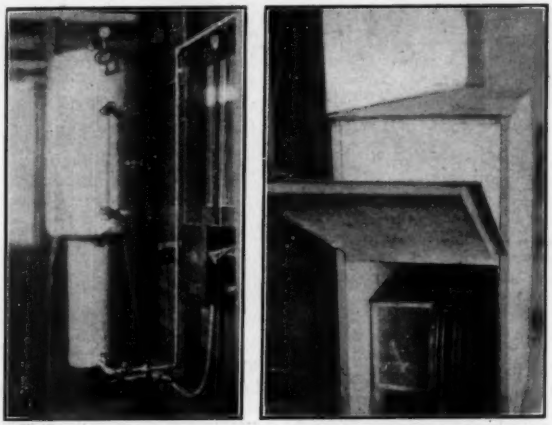
Cleaning the machinery requires but a few minutes of time and this is done at the time the regular washing and scalding of the dairy utensils occurs.

The rubber tubes are left from one milking to the next in a special disinfecting solution which is considered standard for this purpose. It is the firm belief of Groves that milk from his dairy is cleaner and contains fewer bacteria than would be possible from hand milking.

Probably one of the most interesting experiments ever carried on in connection with electrical dairying was that sponsored by the Wisconsin Electric Company some time ago. They equipped a dairy farm electrically and kept accurate records since that time to prove whether or not electrification of a dairy farm would be financially satisfactory.

This farm was located 5½

**The Stock on an Electrified Farm can be Kept in a Cleaner and more Sanitary Condition, Thanks to the Electric Clipper.**



**Electric Dairy Sterilizer on a San Joaquin Valley Farm Where 80 Cows Are Milked Daily**

**Left—View of the insulated water tank containing a 5-kw. heating element. Right—Sterilizer box for the dairy utensils. Over a period of 5½ months, 4,170 kw.-hr. was consumed at a cost of $69, an average cost for sterilizing of 43 cents a day.**

miles southeast of Lake Geneva, Wisc., and is a typical dairy farm, and in no sense a model or show place.

The company equipped the farm in the conviction that the conveniences which electricity can give the farmer and his wife cannot be valued in dollars and cents, but that the time saved by electricity in doing farm work can easily be figured in terms of money saved. The time thus saved can be used on other branches of farming. Diversified farming means larger income from the same amount of land, more stock fed for market, a larger dairy herd and more crops. But the larger income made possible through the release of manpower for more diversified farm operation is not included in the records of the demonstration farm.

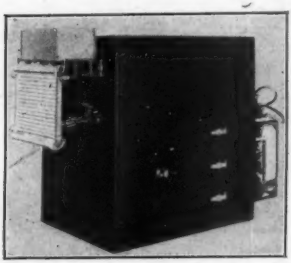
Those records, worked out in actual experience, cover the operating cost and consumption of milking, ironing, milk house ice machine, electric pump and lighting, milk house and residence, water heaters, range, residence refrigerator, and twenty pieces of additional equipment too small for separate meters.

Mr. L. E. Meyers, president of the Southern Wisconsin Electric Company, reports that the total monthly cost of operating all this equipment is $51.41, the average per kilowatt hours used monthly 1138.9, the average cost per kilowatt hour 4.51 cents per month, and the monthly average man hours saved 214.

Figured at the rate of 50 cents per hour, the saving of 214 hours in man labor per

$51.41, leaves a balance of $55.59 per month or $666.08 per year as the amount actually saved by the use of electricity. The monthly saving, applied on the cost of the equipment, would soon make the electrical apparatus pay for itself.

These are the figures upon



**The Latest Development—An Iceless Milk Cooler Operated by Electricity. A mighty Compact and Valuable Unit for any Farm.**

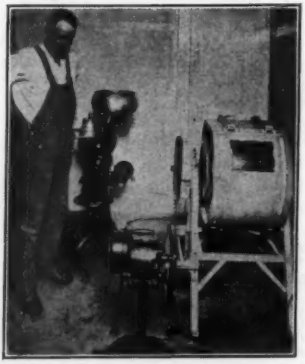
whose basis the farmer can determine whether there would be a profit or saving to him in the electrification of his farm.

The dairy farm requires an abundance of fresh, clean water. On the demonstration farm in Wisconsin an automatic system with pressure equal to that in the city has been installed and replaced the antiquated windmill, and the water is piped to the house, barn and all outbuildings.

When the water in the reserve tank drops below a certain pressure, the electric motor automatically starts pumping and continues until the tank is refilled. An automatic soft water system, which works on the same principle, has been installed in the house.

The constant supply of fresh, clean water which helps to increase the flow of milk from the dairy herd is provided by the pumping system, which keeps the yard tank and drinking cups installed between the stanchions in the cow barn full at all times.

The milk house water heater, costing an average of $7.55 per month, uses 213 kilowatt hours and saves 40 man hours; while the residence water heater saves the same number of man hours and uses 208 kilowatt



**The Portable Motor Around the Dairy is Mighty Handy. It can be Lifted from Place to Place and Serves as the Motive Power for any and all of the Many Dairy Appliances.**

hours at an average monthly cost of $7.08. The residence heater is automatic and furnishes an abundance of hot water at all times.

After milking on the Lake Geneva Farm the milk is taken

(*Continued on page* 33)

Here's a Fine Big Flow of Water Delivered by an Electrically Driven Pump at the Salt River Irrigation Project in Maricopa County, Arizona. The Flow You See Is Approximately 4,500 Gallons Per Minute.

# Power Irrigation

## *One Solution to the Problem of Light Crops*

"I CAN only grow alfalfa on that plot for it is too dry for anything else," a farmer remarked to the writer recently.

But the average farmer with electricity on his farm does not have to take that attitude. There is almost invariably a plenteous supply of water underground and at not too great a distance to reach. It is only a question of getting the water from the ground to irrigate any land which would benefit by irrigation.

The writer recently visited a farm in Montana where wheat was grown with fair success, but with an occasional crop failure due to lack of water. But at a point just seven miles north of this particular location another farm with even less chance of securing water from surface streams or rain has not had a crop failure in the last seven years—since water was pumped from the ground for irrigation purposes. The only difference between these two farms is that one has central station service and the other has not.

The farm with central station service has rigged up an electrically driven pump, operated by remote control from the farm house. A large pit or well has been dug and the pump placed over it.

Whenever water is wanted for irrigation, it is only necessary to close the remote control switch at the farm house and the pump in the pump house

starts lifting the water, which has accumulated in the well, and sending it down the irrigation ditch to the point desired.

Electricity is by far the most desirable power for pumping. It is dependable, and is certain.

Unlike the heavy gasoline engine, the electric motor is comparatively light, few moving parts, and stands much less chance of going out of commission than the gas or oil engine.

As a matter of fact in some cases motors have run for decades without any servicing except occasionally oiling. Where the cost of power is moderate, irrigation can be made to pay.

## Power Costs Little

The small cost of power is returned many fold by the increased value of the crop.

Then, too, the use of power irrigation absolutely prevents the "bad year" in crops, such as is experienced in farming communities depending solely upon rain fall or surface water for irrigation.

Out in the Pacific Coast states, electricity is making the farmers life worth living by providing him with dependable, cheap power which in turn means a sure water supply for irrigation when it is needed.

And very rapidly are the advantages of electricity on the farm being made available to farmers throughout the country by extension of high tension lines.

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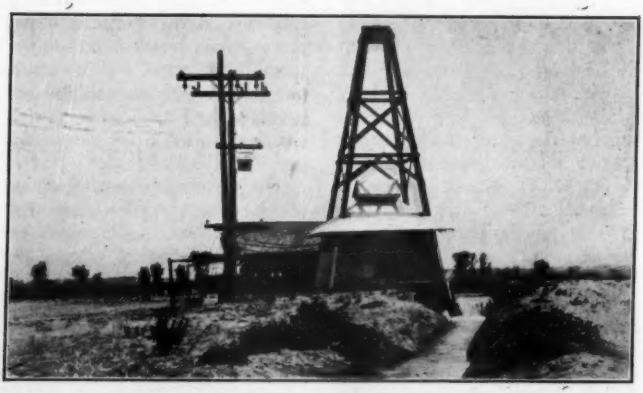
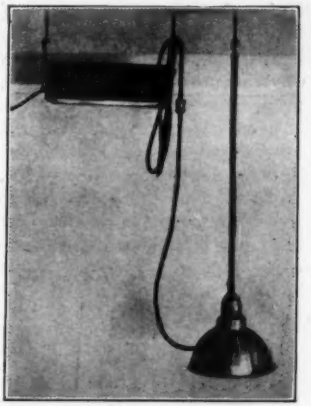
It has been predicted that 2,000,000 farms will be electrified by 1937. If the movement maintains the rate of growth experienced during the past year, the prediction will be consummated



**How's This for Irrigation Water. 3,800 Gallons Per Minute from a Single Electrically Driven Pump in the Salt River Irrigation Project of Arizona.**



One Ultra Violet Ray Lamp Now Being Produced Commercially for Use by Poultrymen. It Consists of a Quartz Mercury Arc Lamp Together with the Necessary Appliances for Operation on Either 110 or 220 Volt Alternating Current—the Kind of Current Supplied by Rural Lines.

# Keeping Chickens Free From Sickness

THE old law of supply and demand operates with full vigor in the field of poultry raising.

In the springtime when eggs are most plentiful the price drops, while in the winter, when the production of eggs is at its lowest, the prices for fresh eggs reach the top mark.

Likewise the price for young poultry is higher in the fall and winter than in summer when nature is more helpful in growing the poultry.

It is well known that the modern high pressure methods of raising poultry out of season both for market and egg production has led to the development of ailments and diseases which have been serious handicaps to the progressive farmer and poultryman.

It is among these off-season chickens that sickness is most likely to occur. But scientists have not been asleep. After thorough experiments over a period of years it has been found that many of the ailments among poultry are due to the lack of direct sunlight in the poultry houses. The search has shown that a certain element of direct sunlight, commonly known as ultra violet light, is taken out when this sunlight passes through ordinary window glass. It is the lack of this paritcular kind of light that has been the cause of large losses in the production of chickens and eggs.

Professor J. S. Hughes, of the Kansas State Agricultural College, Dr. C. T. Little, of the

University of Maine, and Dr. W. T. Bowvie of Harvard University, have found through experimental research that the proper use of ultra violet light is a complete substitute for the normal exposure to direct sunlight in the raising of chickens. A short exposure each day to a large amount of ultra violet light has been found to entirely offset both the lack of direct sunlight and in some cases the lack of daylight of any kind.

### Increases Egg Production

As demonstrated by Professor Hughes, the use of ultra violet light will increase egg production, hatchability of eggs produced, as well as prevent and cure epidemics of weak legs, or rickets.

Also larger birds, more fully developed, can be produced in shorter time when treated with ultra violet light. Ultra violet treatment makes possible the raising of chickens indoors at all times of the year without the risk of large loss from the diseases above mentioned.

### Improves Poultry

The University of Wisconsin Agricultural Authorities also conducted tests which demonstrated conclusively the effectiveness of ultra violet lights in preventing illness and improving poultry raising in general.

### Look at This Report

The University of Wisconsin, in order to test chickens raised by ordinary means, took a flock of Barred Rock chicks, hatched August 18th, which were purchased from a hatchery for late broilers. These were fairly good strong chicks, and at the age of two weeks, when the experiments began, they weighed 4 2/5 ounces each on the average.

Up to the time they were received at the Wisconsin University, the original 200 chicks had been kept in a small colony house 8 x 12 feet ,with a coal heated colony brooder, and allowed a small outside run about 12 feet square. Seven chicks had died, leaving 193, and from this lot 40 chicks were taken and placed in a room about 8 x 14 feet in a brooder house with a coal heated colony brooder stove and were never allowed out of this pen during the following 6 weeks. This room had one window facing the south and one facing the west. Both sashes were hung at the top and the glass windows were opened out at the bottom for ventilation, but very little sunlight could enter the pen except through the glass windows.

### Chicks Thrive

As we all know, chicks kept under these conditions at this season of the year would not thrive, to say the least, and we would expect at least a third of them to die. The problem which the University wanted to work out was to see if they could keep chickens under adverse conditions in this way and do as well as chicks on range, the only difference in their treatment being the ultra violet ray used on birds in confinement about 25 minutes each day. (*Continued on page 32.*)

## Another Use for Farm Electricity

Word reaches us from Minneapolis of a Minnesota farmer who has found a new and profitable application for electricity on his farm.

Before electricity was available to him it cost so much, and was so difficult, to heat the whole sow house that this farmer lost on the average of three pigs on each litter. Where the sows farrow twice a year, the spring litter comes in early March at which time the sow shed is apt to be damp and cold. The trick is to dry out the newborn pigs immediately and keep them warm for the first hour.

With electricity, this farmer wired his shed with individual out-lets in each sow pen, and as soon as each sow farrowed, he plugged in a bowl type radiant heater in that particular pen. Last season, he saved an average of two pigs from each litter. Each pig was worth from $5.50 to $6.00. He had 46 sows in the shed. And his total current cost, chargeable against the extra profit on the 92 pigs, was only $9.00.

## Pretty Soft for the Horse, We'll Say

No more sharp curry combs nor stiff bristle brushes for the army horse. Capt. A. C. Fitzhugh has invented a vacuum cleaner which does all the work in grooming horses. The nozzle is equipped with a brush of special make, with which the backs of the animal are massaged in a manner similar to that followed in the old grooming brush. And it certainly works.

**Enjoying a Vacuum Cleaning**

## Poultry House

(*Continued from page 9*)

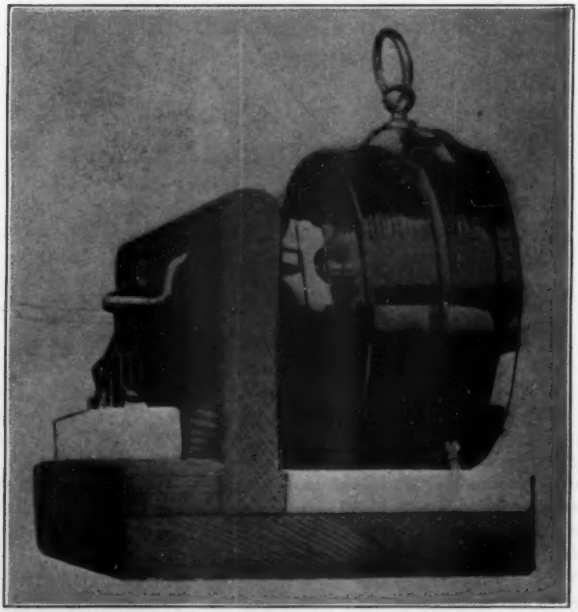
103 degrees, turns the eggs six times every 24 hours, shows a signal if anything goes wrong in any one of the compartments, starts illumination of the entire plant promptly at 6 o'clock each evening, cutting it off the following morning; drops the door to each compartment at the 21st day, so that the hatched eggs may have light and air; then turns on the heat in the huge brooders, to which a force of men transfer the 560,000 chicks of each setting.

Electric brooders serve excellently for raising poultry, being thoroughly dependable and at the same time comparatively inexpensive in operation.

As electric incubators are now being manufactured in almost all sizes, the coming of electricity to the farms is going to simplify the raising of poultry to a marked degree and the farms which are first to adopt electric incubators will likely be the ones which will lead as the industry continues to grow.

### Method of Using Lights

There are four distinct systems of using lights to increase



**A Simple Time Switch Hookup Using an Alarm Clock and a Single Pole Knife Switch.**

egg production. There is no great difference in the results secured by the various systems.

The four systems are as follows:

THE MORNING AND EVENING SYSTEM—This method of lighting has one particular advantage over the other methods in that the operator can have control over the changing period of twilight and dawn, and variation in the amount of light from day to day due to climatic conditions, thus giving the birds a uniform day and a uniform night the entire winter season. This system makes an even amount of time between breakfast and supper and makes it possible for the bird to get her food and exercise and with regularity.

THE MORNING LIGHT SYSTEM—This method of lighting requires no dimming device, and the operator is always at home when the lights are used. These points, coupled with the fact that the light is given when the bird is rested and cold promotes more exercising on the part of the bird, particularly if the grain is fed in deep litter. This system is very generally used on dairy farms where the operator is up early to care for the dairy.

THE EVENING LIGHT SYSTEM—This system in continuing the length of the day insures the birds having ample time to fill their crops before going to roost. It also makes the days end uniformly.

THE EVENING LUNCH SYSTEM—This system breaks up the long period between night and morning feeding by giving them an hour of light around 9 P. M. It also gives the birds opportunity to get ample feed without losing much sleep. The cost of operation is less, and the results secured are about the same as with other methods of lighting. Dimming devices must be used with this plan.

## The Farm of the Future

When I wake up in the morning I roll around in bed,
And press the little button in the wall beside my head;
The vacuum cleaners in the barn begin their daily chores.
Currying the horses and sweeping up the floors;
The automatic milker gets busy on the cows,
While conveyers pass the hay around for bossy's morning browse;
The leghorns' grain is scattered wide to make 'em use their legs,
As the button sets the counter to adding up the eggs;
A click, a whirr, the rotary is plowing through the snow,
Which melts like magic off the steps as the fans begin to blow;
The twenty horsepower saw and ax will uncomplaining chop
The firewood for the kitchen stove until the switch says stop;
Hot water fills the bathtub, and my nose imports the news
The electric stove is glowing, and the good old mocha brews.
I stretch, and feel that zero is not without its charm,
Since dad at last consented to electrify the farm.

—E. H. Aberdeen, in *Westinghouse "Farmfax."*

## Keeping Chickens Well

(*Continued from page* 28)

The other stock was given free range on grass ground with plenty of shade under the most favorable conditions for their growth that could be provided at this season. Both lots were given as nearly as possible the same system of feeding and care, but during a very warm spell of weather the chicks in confinement suffered somewhat from overheating, as it was necessary to keep the fire burning constantly for cold nights. An oil heated brooder or a larger room would have been an advantage during warm weather. The 40 chicks in confinement were irradiated with an air cooled, mercury vapor lamp hung about 3 feet from the floor about 25 minutes each day. Sometimes this would be done in the daytime, but quite often when the University Agricultural Station was very busy it would be done in the evening and the birds would eat and drink under the artificial sunlight.

### Increase in Weight

At the end of 6 weeks when the chicks were 8 weeks old, 37 chicks which had been treated with the ultra violet ray weighed 43 pounds while 140 chicks on free range weighed 147 pounds. Thirteen chicks were lost from those on the range and 3 from those in confinement. The irradiated (treated with rays from the ultra violet ray apparatus) chicks clearly showed better growth and bone development.

As ultra violet ray lights, of comparative simplicity, and of moderate price, are now on the market it is very likely we will see all chicks in the future receiving their daily "sun" bath of ultra violet rays. Certainly, when ultra violet rays can prevent sickness, increase strength of chicks, and decrease the number of deaths, even during the most troublesome seasons of the year, it is something which will soon find its way on all progressive farms raising poultry.

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## The Water System

(*Continued from page* 11)

have dependable service, then you've got to look to electric current for this service.

If you have a truck garden, you're able to grow better produce by proper irrigation, and if such irrigation is not provided through streams or rainfall, then water is absolutely necessary and will prove a mighty paying investment.

And last, but not least, water systems in farm houses, when properly installed and properly maintained, prove a mighty fine preventative of disease.

For instance, last year the Illinois Department of Health reported that of the 2,728,178 rural inhabitants of the state 205 died of typhoid fever while of 4,236,772 city dwellers, only 121 died. In the case of rural typhoid, it almost invariably originated in the water supply. And the benefits of having plenty of water for household use—water of a pure, wholesome quality—are self evident.

## Electricity on Dairy Farms

(*Continued from page 24*)

to the milk house, where it is poured over coils through which water cooled by the refrigerating machine is circulated. This chilling takes all the animal heat from the milk at once and does away with the old method of stirring for that purpose. The milk is then cooled in a tank of ice cold water which keeps it at even temperature until it is time for it to be taken to the creamery or market.

### Another Use

Another use for electricity in dairying, and particularly on the small dairy farms, has come to the fore recently. It is electric sterilization of milk by electric heating elements placed in proper containers.

These sterilizers use a 4-kw. or 5 kw. heating element with a tank holding 17 pounds of water and a sterilizing container capable of holding four cans. Assuming an average connected load of 4 kw. per sterilizer and an average consumption of 3 kw.-hrs. per day, the cost of operation at 3 cents per kilowatt hour will be 9 cents per day, which compares favorably with 4 to 9 cents per day for gas or oil heated sterilizers, in view of the greater convenience of the electric sterilizer.

Electricity is giving dairy farm refrigeration which is so necessary in cooling the milk following the milking and also the storage of dairy products.

All in all, electricity has proven itself on dairy farms and the small dairy farm of the future, as well as the large, if it expects to succeed must sooner or later adopt electricity.

## Instruct Farm Boys in Electricity

The teaching of vocational agriculture will be materially affected by the constant increase in the use of electricity on the farms of the South, according to I. D. Maltby, Southern Regional Agent for the Agricultural Education Service.

Vocational agricultural teachers should be given instruction in the use of electrical power, Mr. Maltby says, in order that the boys on the farms might be taught how to use and operate farm electric equipment.

"I believe," says Mr. Maltby, "that the time has arrived when very serious consideration should be given to the farm-shop phase of the vocational agricultural course. Electricity is rapidly being used more and more on the American farms.

"I do not believe that electricity will come into common use as a field power in this generation, but I do believe that it will be used more and more around the dwellings and in the operation of small machinery on the farm. If this be true, our vocational agricultural teachers should be given instruction in the use of electrical power, and our boys in turn should be taught how to use and operate farm electric equipment."

# QUESTIONS AND ANSWERS

## "Blowing" Fuses

*Question.* The fuse controlling the circuit in our dairy continually blows out. What do you suggest could be the trouble, and how should it be remedied?

*Answer.* When a fuse blows out, it indicates one of three things. First, the circuit may be overloaded. That is, more lamps or appliances may have been turned on in that circuit than it is designed for, or that the fuse can carry, so that it is drawing a greater amount of current than it is designed to carry safely and the fuse accordingly melts, or blows out to protect the circuit. Second, there may be a short circuit on that particular line. Third, there may be a ground on the line.

If the fuse has blown out because of an overload, turning off some of the lights or taking some of the appliances out of the circuit will show this by the fact that when fuses of the same size are inserted in the cutout, they place the circuit in operating condition again without any further trouble.

If, however, the trouble is either a short circuit or a ground, putting a new fuse in the cutout will result in blowing that fuse as well, showing that the circuit is not open. While the result of a short circuit or ground is the same, they are not produced by the same cause. A short circuit results where two wires of the same circuit come together at a point at which they carry no insulation. A ground results when the positive side of a circuit comes in contact with the earth, or what is the equivalent, a pipe or other metal conductor that runs into the earth.

Many "shorts" come from carelessness in connecting up lamp sockets, connecting plugs, electric equipment and the like, or result from wear from these connections. Flexible cord used for these purposes consists of a large number of very fine wires stranded together and unless all of the strands are firmly connected under the connecting screws, any movement of the connection or appliance tends to cause one or more of these strands to stick up and bend over so that sooner or later it comes in contact with the opposite conductor and a short circuit results.

It is an easy matter to cut off a few inches of the cord and make new connections. Similar short circuits also occur in the screw (plug in) of flexible cord used for washing machines, churns and the like, since the cord is usually used to pull the plug out of the socket. This may be prevented to a great extent by tying a large hard knot in the flexible cord just inside of the plug so that all of the strain comes on this knot and does not reach the actual connections themselves.

# Here You Are!

## —*a free service you'll find mighty helpful*

**When you run across some problem in connection with your electrical installation or equipment —**

**When you need information as to the capabilities of electrical machinery in connection with the work it is to perform —**

**When you are in need of data regarding safe and satisfactory wiring —**

**When you want to know where to secure some particular piece of electrical equipment, or farm equipment operated by electricity —**

**Or, in fact, whenever you have a question you would like to ask relating to electricity or electrical equipment —**

**Write to "Questions and Answers" Editor, "Electricity on the Farm," 225 West 34th Street, New York City.**

**We'll be glad to answer such questions, insofar as our facilities permit, and without charge whatsoever.**

***This is part of the service we render our readers, and we invite you to make use of it.***

**ELECTRICITY ON THE FARM**

**225 West 34th St., New York**

*The Aim of Your Power Company*

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reaches you at the suggestion of national leaders in rural electrification.

This magazine will be sent you monthly in the hope that you will find in it material of interest and value to you for the more successful operation of your farm.

Your comments or suggestions will be appreciated.

**WISCONSIN POWER & LIGHT COMPANY**

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